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Rev. 07/10/02

Second Five Year Review Report
Reilly Tar Superfund Site
Marion County
Indianapolis, Indiana

Richard E. Karl, Director
Superfund Division

6/3/05
Date

Executive Summary

U.S. EPA has implemented a sequence of remedial actions at the Reilly Tar site. These remedial actions have addressed contamination at the site at five operable units, which include: OU 1: perimeter groundwater containment system with off-site discharge to Southport Publicly Owned Treatment Works (POTW); OU 2: In-situ solidification at South Landfill with soil cover, on-site thermal desorption of soils; OU 3: Permeable cover over historical wood treatment area; OU 4: concrete cover over portions of northern area of site and soil vapor extraction of additional area in northern portion of site; and OU 5: Natural attenuation of off-site groundwater contamination in conjunction with continued operation of perimeter containment system.

Considerable progress has been made towards achieving remediation goals with goals achieved for OU 2 and OU 3. Contaminant concentrations in site groundwater have been decreasing at most locations due to the operation of the OU 1 perimeter containment system. Recent optimization efforts have resulted in the cessation of pumping from one of the five extraction wells. A data collection effort currently underway in the north portion of the site may result in additional optimization efforts and is summarized below.

The OU 4 SVE system has been in operation for five years and an upcoming closure sampling exercise will determine if remedial action cleanup standards have been achieved. Preliminary results are favorable. These results will be available in the summer of 2005.

All remedies in place at the site are protective of human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Reilly Tar & Chemical		
EPA ID *(from WasteLAN)*: IND000807107		
Region: 5	**State: IN**	**City/County: Indianapolis/Marion**
SITE STATUS		
NPL status: X Final ☐ Deleted ☐ Other (specify)		
Remediation status (choose all that apply): ☐ Under Construction X Operating ☐ Complete		
Multiple OUs? X YES ☐ NO	**Construction completion date:** 12 /16/1999	
Has site been put into reuse? ☐ YES X NO		
REVIEW STATUS		
Lead agency: X EPA ☐ State ☐ Tribe ☐ Other Federal Agency		
Author name: Dion Novak		
Author title: RPM	**Author affiliation: USEPA**	
Review period: 01/15/05 to 4/30/05		
Date(s) of site inspection: 3 / 24 /05		
Type of review: X Post-SARA ☐ Pre-SARA ☐ NPL-Removal only Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion		
Review number: ☐ 1 (first) X 2 (second) ☐ 3 (third) ☐ Other (specify)		
Triggering action: ☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#____ ☐ Construction Completion X Previous Five-Year Review Report ☐ Other (specify)		
Triggering action date *(from WasteLAN)*: 4/6/00		
Due date *(five years after triggering action date)*: 4/6 /05		

Five-Year Review Summary Form, cont'd.

Issues:

Potential issues with ammonia in northern portion of the site

SVE system may have achieved remediation objectives

OU 1 IC for on-site access-completion and recordation

Recommendations and Follow-up Actions:

OU 1
Ongoing assessment in OU 1 area to augment OU 1 groundwater extraction for ammonia-reports due summer 2005.
Pursuit of additional IC for consensual access for OU 1 consent decree-does not impact protectiveness.
Continued analysis of on and off-site groundwater data with a goal towards continued optimization of the perimeter containment system.

OU 2
Continued monitoring pursuant to terms of OU 2 consent decree, including monitoring of seeps at the South Landfill area

OU 3
Continued operation and maintenance activities associated with soil and gravel covers to maintain their effectiveness

OU 4

Closure sampling in OU 4 area to determine future operational status of SVE system –sampling scheduled May 2005-future operational status dependent on results.

OU 5
Continued monitoring of on and off-site groundwater monitoring results to track the progress of the groundwater containment system towards achieving remediation goals in the off-site area.

Protectiveness Statement(s):

OU 1
The remedy at OU 1 is protective of human health and the environment.
OU 2
The remedy at OU 2 is protective of human health and the environment
OU 3
The remedy at OU 3 is protective of human health and the environment.
OU 4
The remedy at OU 4 is protective of human health and the environment
OU 5
The remedy at OU 5 is protective of human health and the environment

Because the remedial actions at all operable units are protective, the remedy for the site is protective of human health and the environment.

I Introduction

EPA Region 5 has conducted a second five-year review of the remedial actions implemented at the Reilly Tar & Chemical (Reilly) site in Indianapolis, Indiana. This review was conducted from January 15, 2005 to April 30, 2005. A site inspection was conducted with representatives from the U.S. EPA, the Indiana Department of Environmental Management (IDEM), CH2M Hill and Reilly on March 24, 2005. This report documents the results of this review. The purpose of five-year reviews is to determine whether the remedy at the site remains protective of human health and the environment. The methods, findings and conclusions of these reviews are documented in five-year review reports. In addition, five year review reports identify deficiencies found during the review, if any, and identify recommendations to address them.

EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 (c) as amended states:

> If the President selects a remedial action that results in any hazardous substances, pollutants or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after initiation of such remedial actions to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP Part 300.430 (f)(ii) of the Code of Federal Regulations (CFR) states:

> If a remedial action is selected that results in hazardous substances, pollutants or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less than often than every five years after the initiation of the remedial action.

This is the second five-year review conducted for the Reilly site. The triggering action for this statutory review is the date of the previous five-year review, April 6, 2000. Because hazardous substances remain at the site above levels that allow for unlimited use and unrestricted exposure, a five-year review is required by statute.

II Site Chronology

Table 1 below lists the chronology of events for the Reilly site.

Date	Event
1984	Site finalized on NPL
3/87	RI/FS consent order finalized
1987-91	RI/FS completed at site

1989	Reilly changes corporate name to Reilly Industries, Inc.
6/92	OU 1 ROD signed
9/92	Consent order modified to include RCRA corrective action
9/93	OU 2 ROD signed
9/96	OU 3 and 4 ROD signed
6/97	OU 5 ROD signed
10/97	ESD signed for OU 2
12/16/99	PCOR completed for site
4/00	First five-year review completed

III Background

Physical Charactristics

The Reilly Tar & Chemical site (the Site) is located at 1500 S. Tibbs in Indianapolis, Indiana. Minnesota Street divides the 120-acre parcel into two parcels (See Figures 1, 2 and 3). The Oak Park property, occupying approximately 40 acres is located north of Minnesota Street. The Maywood property, occupying approximately 80 acres is located south of Minnesota Street.

History of Contamination

Industrial development of the Site began in 1921 when Republic Creosoting Company started a coal tar refinery and a wood treatment operation on the southern end of the property. On-site wood treatment operations occurred from 1921 to 1972. Beginning in 1941, several chemical plants were constructed and operated on the northern end of the property. Environmental problems at the site are related to the management and disposal of creosoting process wastes and to wastes associated with and substances used in the process of manufacturing specialty chemicals.

Land and Resource Use

A mix of residential, industrial and commercial properties surrounds the Site. Residential neighborhoods are located immediately adjacent to the eastern property boundary of the Oak Park parcel. Two residences are located abutting the northwest corner of the Site. Commercial and industrial properties are also located south and west of the Site. All residents in the area of the contaminated groundwater plume have been connected to the municipal water supply.

Initial Response

In 1984, Reilly was listed on the National Priorities List (NPL) making it eligible for cleanup under the Superfund program. In 1987, Reilly agreed to conduct an RI/FS to evaluate and compare remedial alternatives according to the terms of the consent order between EPA and Reilly. The RI identified five main source areas on-site that were the

FIGURE 1

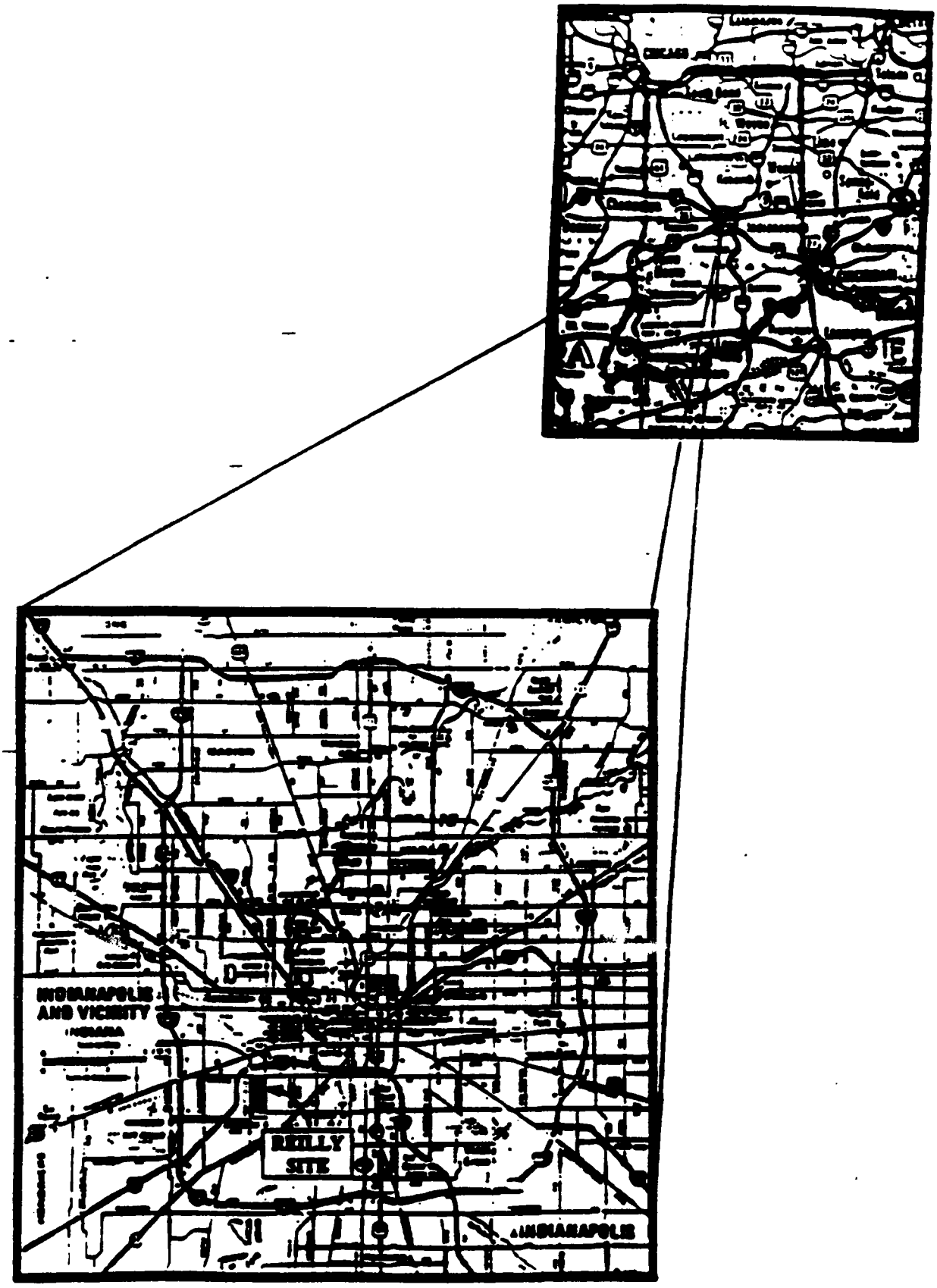

INDIANAPOLIS
AND VICINITY
INDIANA
REILLY
SITE
INDIANAPOLIS

FIGURE 2

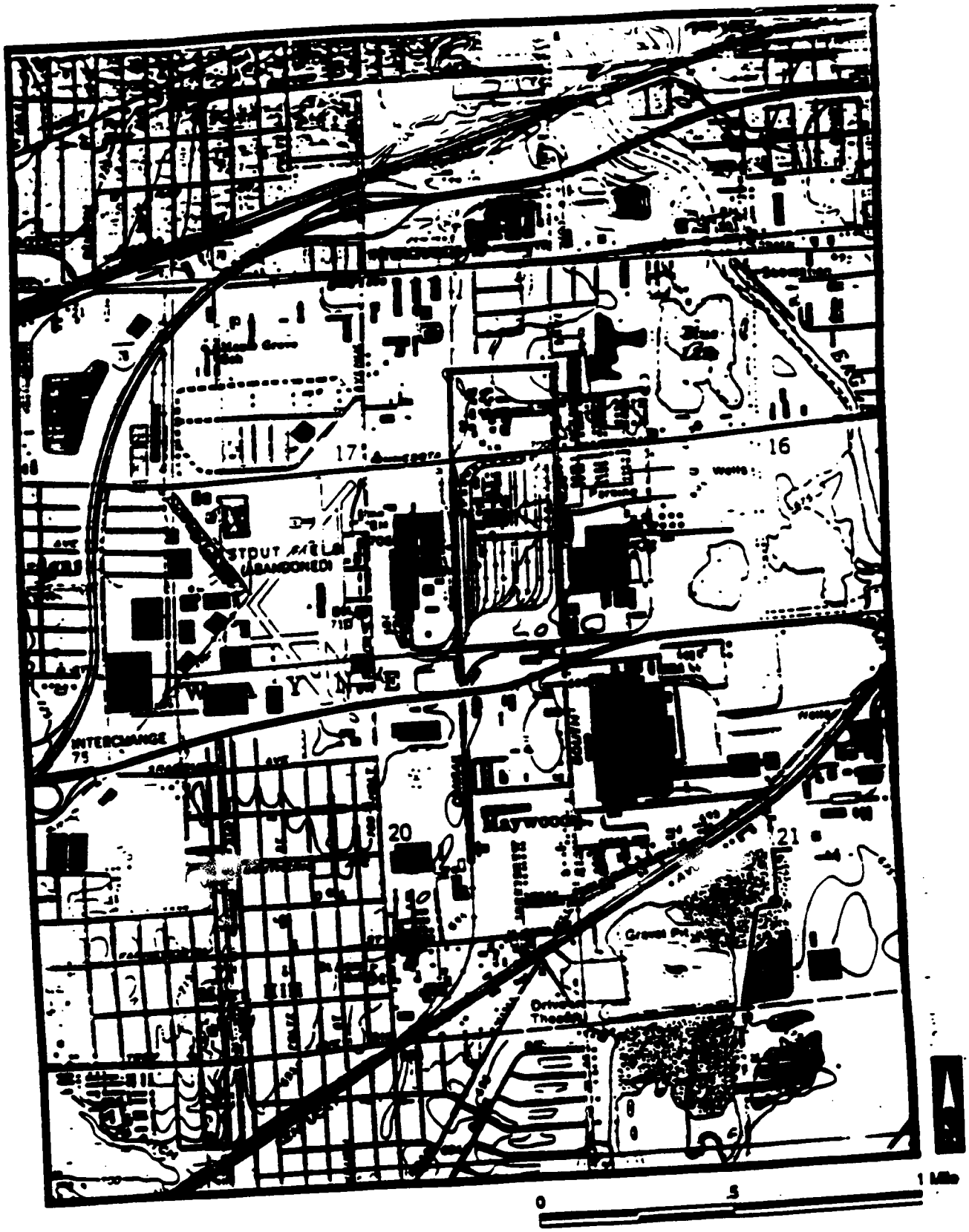
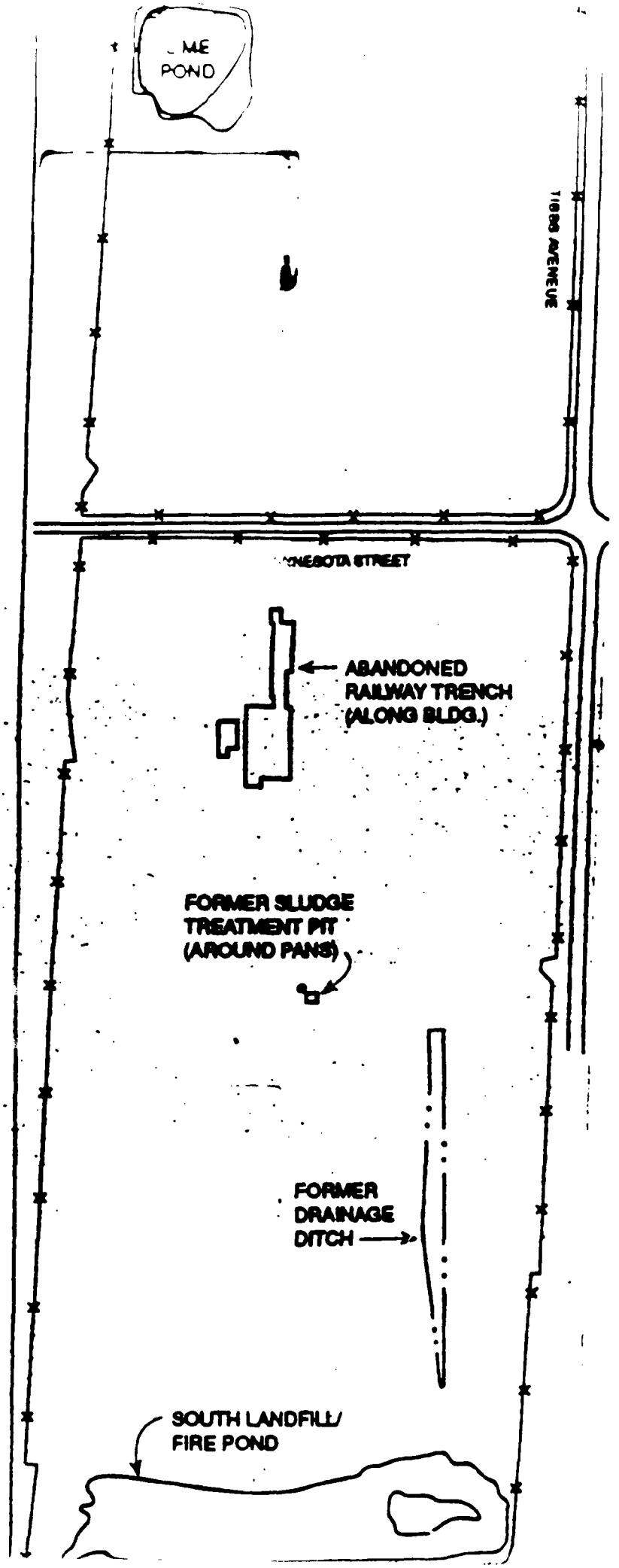

17
16
20
21
INTERCHANGE
75
0
5
1 Mile
APPROXIMATE
SITE BOUNDARY

FIGURE 5


ME POND
TIBBS AVENUE
NESOTA STREET
ABANDONED RAILWAY TRENCH (ALONG BLDG.)
FORMER SLUDGE TREATMENT PIT (AROUND PANS)
FORMER DRAINAGE DITCH
SOUTH LANDFILL/ FIRE POND

primary contributors to soil and groundwater contamination at the Site. These included the Lime Pond, the Railway Trench, the Sludge Treatment Pit, the Drainage Ditch, and the South Landfill/Fire Pond. The RI documented a plume of groundwater contaminated with benzene, pyridine and ammonia that had migrated off-site at unacceptable levels that required remediation.

Basis for Taking Action

Remedial investigation sampling identified areas of on-site soil contamination at levels that posed unacceptable risks to human health and the environment

IV Remedial Actions

Remedy Selection

OU 1
Groundwater containment at site boundary with groundwater extraction and discharge to off-site POTW.

OU2
On-site thermal desorption for areas of organic soil contamination. In-situ solidification of sludge material in South Landfill with soil cover placement when complete.

OU3
Permeable soil cover installation over southern portion of site.

OU4
Concrete cover installation over contamination areas in the northern portion of the site and soil vapor extraction to remediate organic contamination in northern site area.

OU5
Continuation of perimeter containment system outlined in OU 1 and off-site monitored natural attenuation.

Remedy Implementation/ System O&M

OU 1

8/94 to 9/94	two extraction wells installed with discharge to the local Publicly Owned Treatment Works (POTW)
8/97	Two additional extraction wells added to existing network and chemical addition added due to well fouling
Fall 2002	Two extraction wells replaced due to broken well screens
2004	Remedial System Evaluation performed at site

OU 2

7/95 to 11/95	In-site solidification activities completed at South Landfill

9/95 to 5/96	Thermal desorption for 1500 tons of soil
10/96 to 1/97	Thermal desorption of 2100 tons of soil
10/97	ESD changing on-site thermal desorption to off-site thermal treatment
11/97 to 2/98	Off-site shipment of soil for thermal treatment

OU 3

3/99 to 6/99	Permeable cover installation of 8100 cubic yards of gravel and 1600 cubic yards of topsoil

OU 4

9/98 to 12/98	Concrete cover installation over two hot spot areas
8/99 to 10/99	Construction of soil vapor extraction (SVE) system
10/99 to 12/04	Operation of soil vapor extraction system
10/04	Confirmation soil sampling
12/04	Temporary shutdown of SVE system
5/05	Closure sampling for SVE area

OU 5

Ongoing monitoring continues of both on- and off-site groundwater quality to determine the effectiveness of the OU 5 remedy.

V Five-Year Review Findings/Progress Since the Last 5 Year Review

OU 1

The groundwater extraction system at the site perimeter has been operational since October 1994. The system operates continually and pumps approximately 200 gallons per minute. The extracted groundwater is discharged through sewers located on the Reilly property to the local Southport POTW. Reilly has addressed several problems that have arisen from the operation of the perimeter extraction system. These were documented in the first five-year review for the site and included use of a chemical additive to the extraction wells and the installation of two additional extraction wells. The annual performance reports prepared by Reilly have indicated that the off-site levels of contamination are decreasing at many wells. These annual reports also indicate that the on-site levels of contamination are also decreasing.

HSI Geotrans, under contract with USEPA Headquarters, performed a remedial system evaluation at the site, which was finalized in February 2004. This report recommended revisiting the operations of the OU 1 system with an emphasis on the potential future shutdown of portions of the groundwater containment system due to the success of the various remedial actions at the site. The report suggested that system operations be studied to determine if on-site containment would continue to be necessary given the success at removing multiple contaminant sources as a result of implemented remedies. The report also recommended that partial shutdown of the perimeter system may be an interim option worth pursuing due to the decrease in on and off-site contaminant levels.

In a letter dated September 10, 2004, Reilly requested that pumping be discontinued at PW-3 and PW-4 presenting monitoring data that demonstrated that previous remedial actions at the site had improved the groundwater quality in the area of these wells and discontinuing their operation would not negatively impact the OU 1 system. Reilly proposed to add an off-site monitoring well to assist in off-site trend analyses and to increase the frequency of monitoring at RI-2S from semi-annually to quarterly.

In a letter dated March 4, 2005, EPA approved the shutdown of PW-4 as monitoring data in the area of this well has indicated contaminant concentrations in this area are achieving OU 1 performance standards. EPA did not approve the shutdown for PW-3 because recent data has indicated that levels of ammonia in the subsurface on the northern portion of the property are not decreasing at levels consistent with long term operation of the perimeter containment system or in off-site monitoring wells. On-site sewers and sewer basins were studied in 1995 and many were repaired because they were leaking. Recent discussions with Reilly have resulted in several reports to be submitted shortly that will summarize operational information for on-site sewers, summarize the previously completed sewer repair information, and highlight potential areas for additional integrity testing. This information will be used to determine if additional sewer repairs or other measures are necessary to reduce potential ammonia impacts in the northern area of the site.

OU 2

Long term monitoring of the remedial actions under this OU was outlined in the first five-year review. All remedial actions have been completed and long term monitoring continues. Sludge seeps from the south landfill area have continued but the amount of sludge transported off-site has decreased dramatically since the last site review. EPA inspected this area during the recent site visit and confirmed that monitoring activities continue to satisfy appropriate requirements; there were no sludge accumulations at the time of the inspection. Requirements for monitoring of and remediating future seeps are contained in the OU 2 O&M plan.

OU 3

All construction activities have been completed and were documented in the previous five-year review. At the recent site inspection, EPA inspected these covers and they continue to perform as designed.

OU 4

The concrete covers were completed and documented in the previous five-year review. They have been recently inspected and are performing as designed.

The SVE system has operated since the last five-year review. The system consists of 10 extraction wells and five blowers. The blowers have been alternately rotated between the 10 extraction wells to facilitate active and passive vapor movement throughout the OU 4

area. The SVE system extracts VOC's from the shallow soils by inducing air into the subsurface to stimulate the active biodegradation of subsurface contamination. Extraction well off-gases are measured quarterly and respiration testing is performed to determine the rates of active biodegradation in the OU 4 area. The blowers have been rotated periodically to further stimulate the rates of biodegradation.

Respiration testing results have shown significant measured biodegradation in the OU 4 area and Reilly proposed collection of preliminary confirmation samples to gauge progress towards OU 4 cleanup goals. In October, 2004, confirmation samples were collected at three depths at three boring locations and results were compared to samples previously collected at the start of SVE operations. The results indicated that cleanup levels had been achieved in these areas; results were below detection limits.

Reilly has petitioned EPA for final closure of SVE operations in the OU 4 area based on these preliminary results. Final closure soil sampling will be conducted in May 2005 at six additional locations to determine if OU 4 SVE operations have successfully achieved OU 4 cleanup standards for OU 4.

OU 5

Off-site contaminant levels have decreased since the initiation of the OU 1 perimeter system. The effectiveness of natural attenuation in remediating the off-site groundwater plume is monitored quarterly and the latest results indicate that natural attenuation reduction is occurring.

VI Five Year Review Process

Administrative Components

Site review meeting held on March 24, 2005, in which representatives from Reilly, U.S. EPA, and the Indiana Department of Environmental Management discussed site remediation progress as well as walked the site to assess remedy performance. Site inspection of remedy components held at that time, including walkthrough of OU 4 SVE remediation area, perimeter OU 1 well inspections, and visual inspections of the OU2, OU3, and OU 4 concrete and soil covers.

Community Involvement

In an advertisement in the Indianapolis Star on March 28, 2005, notice was given to the public that the completed second five year review would be available at the Indianapolis Interim Central Library upon its completion.

Data Review and Assessment

OU 1

The perimeter groundwater extraction system continues to perform as designed. As mentioned previously, Reilly will be producing additional information regarding potential continuing ammonia sources and will be tasked with discovering the source(s) for this ammonia as well as correcting any problems. Monitoring of groundwater continues on a regular schedule with some wells monitored quarterly, some semi-annually, and some annually. Monitoring results are transmitted to the Agencies in quarterly reports along with contaminant contour maps and extraction well information. U.S. EPA continues to track the progress of the OU 1 system and will do so indefinitely under the terms of the OU 1 consent decree.

EPA will assess the information to be provided regarding the on-site sewers and if additional sewer repairs or other active remediation measures are necessary, EPA will direct Reilly to perform the necessary repairs. EPA will continue to monitor the concentrations of contaminants in off-site wells to monitor progress of the OU 1 system towards achieving remediation goals.

EPA may revisit the Reilly request for shutdown of PW-3, depending on the results of the additional sewer analysis-this will be documented in the next five year review.

OU 2

The success of the OU 2 remedies continues and monitoring of landfill sludge seeps will continue.

OU 3

All covers are in place and performing as designed.

OU 4

The SVE system has made significant progress towards achieving ROD performance goals. The results of the confirmation sampling outlined above will dictate the future operational status of the SVE system and will be reported in the next five year review.

OU 5

Off-site contaminant levels continue to decrease, indicating the success of the OU 1 extraction system at remediating the aquifer. EPA will continue to monitor the progress of the off-site remediation by reviewing the annual trend analyses and reviewing groundwater extraction system data.

IC's required by the consent decrees are as follows:

OU 1

1) Record a certified copy of the consent decree with the Marion County Recorders Office-**completed 9/30/94**
2) Record a notice of obligation to provide access under Section X of consent decree-**not completed yet**

OU 2

1) Deed restrictions prohibiting use of groundwater on-site, on-site residential use of the property, on-site excavations, or interference with the work to be performed under the consent decree, unless prior approval obtained from US EPA-**completed 3/3/95**

OU 3/4/5

1) Deed restrictions prohibiting use of groundwater on-site, on-site residential use of the property, on-site excavations, or interference with the work to be performed under the consent decree, unless prior approval obtained from US EPA-**completed 11/17/98**

VII Technical Assessment

At present, all of the remedies are performing adequately and achieving ROD performance standards. There are no deficiencies at present with any of the implemented remedies.

VIII Issues

There were no specific issues found as a result of this review that affect the current or future protectiveness of the remedies. SVE closure sampling will determine future operational status of OU 4 remediation. Ammonia investigation in OU 1 area will determine future operational status of perimeter groundwater system.

IX. Recommendations and Required Actions

This five-year review report has summarized the current remedial activities at the site and also describes the future monitoring of each constructed remedy at the site. The following actions are recommended for continued operation and maintenance of site remedies:

OU 1

Recommendation from April 2000 Five Year Review

1) Continued monitoring of site groundwater

Status: Ongoing according to OU 1 O&M plan

2) Complete trend analysis for groundwater contamination data

Status: Completed annually. Off-site well contaminant concentrations are decreasing in many locations

3) Perform optimization analysis on groundwater extraction and treatment system

Status: Completed in February, 2004.

As outlined above, the operational status of PW-3 is dependent on the results of the additional on-site sewer analysis, to be submitted in May 2005. PW-4 was shut down in March 2005 as a result of remedy optimization as outlined above.

Current recommendations

Continued monitoring of site groundwater in accordance with the OU 1 consent decree. Additional analysis of on-site sewers and potential repairs are necessary to optimize the effectiveness of the OU 1 system in removing contaminants from the aquifer. Institutional control for access from consent decree not completed yet will be pursued and this will be reported in the next five year review. This does not impact the protectiveness of the remedy as Reilly has always granted access to the Agencies when requested.

OU 2

Recommendations from April 2000 Five Year Review

1) Continued monitoring of OU 2 areas, including continued collection of coal tar seeps from South Landfill area

Status: Ongoing. Quantity of drums of coal tar seepage decreasing over time

2000 (10)
2001 (8)
2002 (3)
2003 (6)
2004 (1)

2) Trend analysis of wells down gradient of source areas to assess decreased load to down gradient areas

Status: Results of analysis indicate that significant reductions in contaminant concentrations in downgradient areas which resulted in the recent shut down of extraction well PW-4.

Current Recommendations

Continue monitoring of coal tar seeps pursuant to OU 2 O&M plan

OU 3

Recommendations from April 2000 Five Year Review

1) Monitor progress of vegetated soil cover and reseed areas that lack adequate coverage and maintain gravel cover thickness.

Status: Completed and current vegetative and gravel cover are adequate.

Current recommendations

Continue monitoring of covers.

OU 4

Recommendations from April 2000 Five Year Review

1) Continued monitoring

Status: Ongoing

2) Presentation of SVE performance data

Status: Completed quarterly. System performance is also measured by completion of respiration tests on system effluent-these results are also summarized in the quarterly reports.

Current recommendations

Analyze the results of the upcoming confirmation sampling to determine if SVE system has achieved ROD performance goals. If results are favorable, SVE system may be shut down. If results are above ROD performance goals, then the system will continue to operate.

OU 5

Recommendations from April 2000 Five Year Review

1) Monitor off-site groundwater concentrations to measure natural attenuation performance and perform trend analysis.

Status: Performed annually

:ent recommendations

Continue to monitor the progress of natural attenuation on off-site contaminant concentrations with groundwater data collected pursuant to the site consent decrees.

X Protectiveness Statements

OU 1
The remedy at OU 1 is protective of human health and the environment.

OU 2
The remedy at OU 2 is protective of human health and the environment

OU 3
The remedy at OU 3 is protective of human health and the environment.

OU 4
The remedy at OU 4 is protective of human health and the environment

OU 5
The remedy at OU 5 is protective of human health and the environment

Because the remedial actions at all operable units are protective, the remedy for the site is protective of human health and the environment.

X Next Review

The next five-ye.: review will be conducted within five years of the completion of this report, which will be May, 2010.